Health Consultation

Private Water Wells Near Old Brazos Forge

OLD BRAZOS FORGE INCORPORATED

BRENHAM, WASHINGTON COUNTY, TEXAS

EPA FACILITY ID: TXD048901235

DECEMBER 12, 2000

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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Prepared by:

Texas Department of Health
Under Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

BACKGROUND AND STATEMENT OF ISSUES

The Texas Natural Resource Conservation Commission (TNRCC) asked the Texas Department of Health Environmental Epidemiology and Toxicology Division (TDH) to evaluate the potential health risks associated with drinking water from two private water wells northwest of Brenham, Washington County, Texas. The wells were sampled as part of an investigation of the Old Brazos Forge site, a former manufacturer of wire shelving.

Between 1965 and 1988, the facility used metallic salts and electroplating in the manufacturing of the wire shelving. Untreated sludges and wastewater from the operation were discharged into trenches and unlined surface impoundments on the site. Some of the sludges and wastewater overflowed into a nearby unnamed tributary of Little Sandy Creek. Antimony has been detected in on-site soil at 41.9 milligrams of antimony per kilogram of soil (mg/kg) [1].

The closest well is between ¼ and ½ mile southeast of Old Brazos Forge. This well is downgradient from the site and is not yet in use (Inactive Well). The second well is approximately ½ mile east of the Old Brazos Forge site and is used by two adults and two teenagers for drinking and other household needs (Active Well) [2].

In December of 1999, the TNRCC Site Discovery and Assessment Program collected and analyzed samples from the two wells and found water from the active well contained antimony at 8 micrograms per liter (µg/L) [1]. Water from the inactive well contained antimony at a concentration of 5.1 µg/L. Water from both wells also contained low concentrations of arsenic and chromium. Because antimony had not been detected during previous sampling events of on-site water wells or other nearby water wells, the detection of antimony in these two wells was thought to be due to a sampling error. In March 2000, the TNRCC resampled the two wells. Antimony was not detected (detection limit 2.0 µg/L) [3].

DISCUSSION

Health Assessment Comparison Values

To assess the potential health risks associated with the contaminants found in the well water, TDH compared each contaminant found in the well water to its health-based assessment comparison (HAC) values for non-cancer and cancer endpoints. We used the U.S. Environmental Protection Agency's (EPA's) reference doses (RfDs) or the Agency for Toxic Substances and Disease Registry's (ATSDR) minimal risk levels (MRLs) to derive the noncancer HAC values. RfDs and MRLs are estimates of daily exposures to contaminants that are unlikely to cause adverse noncancer health effects even if exposure occurs for a lifetime. The cancer risk comparison values that we used in this consultation are based on EPA's chemical-specific cancer slope factors, an estimated excess lifetime risk of one cancer in one-million (1×10^{-6}) exposed people, and an exposure period of 70 years. TDH used standard assumptions for body weight (70 kilograms, adult; 15 kilograms, child) and water consumption (2.0 liters per day, adult; 1.0 liter per day, child) to calculate the HAC values [4]. When dealing with drinking water, we also compare the contaminant concentrations to their respective maximum contaminant levels (MCLs). MCLs are regulatory limits that the U.S. Environmental Protection Agency (EPA)

establishes as the maximum permissible level of a contaminant in water that is delivered to the user of a public water system. Although MCLs are not enforceable on private water wells, they can be used as a guide when assessing the public health significance of contaminants in drinking water. Using MCLs as a comparison assures that the users of the private well would not be subject to any greater risk than they would experience if they were using a public water supply system. Exceeding a HAC value does not imply that a contaminant represents a public health threat but suggests that the contaminant warrants further consideration.

Assessing the Unique Vulnerabilities of Children

TDH and ATSDR recognize that the unique vulnerabilities of infants and children demand special attention. Children are at greater risk than adults from certain kinds of exposures to hazardous substances. They are smaller than adults, resulting in higher doses of chemical exposure per unit of body weight and the developing body systems of children can sustain permanent damage if toxic exposures occur during critical growth stages. Consequently, children who drink water contaminated with toxic substances may be at greater risk for toxic effects than are adults who consume the same water. In an effort to mitigate children's unique vulnerabilities, and in accordance with ATSDR's Child Health Initiative, TDH evaluated the potential public health hazards associated with children drinking water from these wells.

Assessing Noncancer Health Effects

During the December 1999 sampling event, both antimony and arsenic were detected at concentrations above their respective noncancer HAC values, and antimony slightly exceeded its MCL in the Active Well (Table 1). During the March 2000 sampling event, only arsenic was detected above its HAC value for children, and this was only in the Inactive Well (Table 1). At this time none of the constituents exceeded their respective MCLs.

Assessing Cancer Health Effects

Although arsenic did not exceed its MCL, currently EPA is considering lowering this standard because of the potential carcinogenicity of arsenic. EPA classifies arsenic as a "known human" carcinogen based on a clear dose-dependent relationship between ingested arsenic and cancer [5, 6]. Arsenic was detected in water from the Inactive Well at a concentration above its respective cancer HAC value but was not detected in the Active Well (Table 1). Currently people are not drinking arsenic-contaminated water.

CONCLUSIONS

Chronic ingestion of water from the residential drinking water well(s) poses no apparent public health hazard because under site-specific conditions of exposure, ingestion of the water is not likely to result in any adverse impact on human health.

RECOMMENDATIONS

None at this time.

PUBLIC HEALTH ACTION PLAN

If new data become available that could change the conclusion reached in this report, TDH and ATSDR will be available to reevaluate the site.

REFERENCES

1. Texas Natural Resource Conservation Commission. Allan M. Seils Site Discovery and Assessment Program Fax to John Villanacci Texas Department of Health. Request for health consultation for two private water wells near Old Brazos Forge. March 9, 2000.

2. Texas Department of Health Record of Communication File. Telephone conversation between Susan L. Prosperie (TDH) and Gary Hazelwood (TNRCC-Tyler) regarding wells near the Old Brazos Forge site, Brenham, Washington, County, Texas. April 3, 2000.

3. Texas Natural Resource Conservation Commission. Stephanie Pogue. Remediation Division. Resampling results for Old Brazos Forge Water Wells. April 11, 2000.

4. Agency for Toxic Substances and Disease Registry (ATSDR). Health Assessment Guidance Manual. 1992.

5. Tseng, WP., Chu, HM., How, SW., Fong, JM., Lin, CS., Yeh, S. 1968. Prevalence of skin cancer in an endemic area of chronic arsenism in Taiwan. J. Natl. Cancer Inst. 40:453-463.

6. Tseng, WP. 1977. Effects and dose-response relationships of skin cancer and Blackfoot disease with arsenic. Environ. Health Perspect. 19:109-119.

PREPARERS OF THE REPORT

Susan L. Prosperie, M.S., R.S.
Health Assessor
Environmental Epidemiology and Toxicology Division

John F. Villanacci, Ph.D.
Co-Director
Environmental Epidemiology and Toxicology Division

ATSDR REGIONAL REPRESENTATIVE

George Pettigrew, P.E.
Senior Regional Representative
ATSDR - Region 6

ATSDR TECHNICAL PROJECT OFFICER

Alan W. Yarborough
Environmental Health Scientist
Division of Health Assessment and Consultation
Superfund Site Assessment Branch
State Programs Section

CERTIFICATION

This "Private Water Wells near Old Brazos Forge" Health Consultation was prepared by the Texas Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was initiated.

Technical Project Officer, SPS, SSAB, DHAC, ATSDR

The Division of Health Assessment and Consultation, ATSDR, has reviewed this health consultation and concurs with its findings.

for Chief, State Programs Section, SSAB, DHAC, ATSDR

Table 1 Private Water Well Sample Results from Two Water Wells in the Vicinity of Old Brazos Forge (µg/L)

Chemical	Active Well		Inactive Well		HAC Values
	12/17/99	3/16/00	12/17/99	3/16/00	
Antimony	8.0B	ND (2.0)	5.1B	ND	6 MCL; 4/10 RMEG
Arsenic	ND	ND (2.0)	6.5B	4.4	50 MCL, 3/10 EMEG, 0.02 CREG
Chromium	ND	3.3	ND	ND	100 MCL 30/100 RMEG

B- Below the Contract Required Detection Limit but above the Instrument Detection Limit